US Govt. Perspective on Arctic Research

John Farrell

Executive Director, USARC

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
NOV 2010		**00-00-2010 to 00-00-2010**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
US Goverment Perspective on Arctic Research	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **U.S. Arctic Research Commission,4350 N. Fairfax Drive, Suite 510,Arlington,VA,22203**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES
Presented at the 15th Annual Partners in Environmental Technology Technical Symposium & Workshop, 30 Nov ? 2 Dec 2010, Washington, DC. Sponsored by SERDP and ESTCP.

14. ABSTRACT
The Arctic region and Alaska?America?s Arctic?provide tremendous value to the United States. Without a significant Arctic Research Program, however, those things we value in and from the Arctic?energy, food, security, biodiversity, fresh water, carbon sinks, pristine wilderness, more direct transport routes, rich indigenous cultures?cannot contribute as well or be sustained. There is little human activity we know of in the Arctic that is not ?knowledge based.? The Arctic continues to be rich in mysteries that can only be solved with pioneering exploration and research. With greater knowledge, the Arctic region can contribute more to both the global economy and the environment. Knowledge about Arctic processes can help protect the world from expensive, unnecessary, and destructive climate change. The U.S. Arctic Research Program must strengthen its efforts on five central and crosscutting themes 1. Environmental Change of the Arctic, Arctic Ocean, and Bering Sea 2. Arctic Human Health 3. Civil Infrastructure 4. Natural Resource Assessment and Earth Science 5. Indigenous Languages, Cultures, and Identities

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**37**	

U.S. GOVERNMENT PERSPECTIVE ON ARCTIC RESEARCH

DR. JOHN FARRELL
U.S. Arctic Research Commission
4350 N. Fairfax Drive, Suite 510
Arlington, VA 22203
(703) 525-0113
jfarrell@arctic.gov

The Arctic region and Alaska—America's Arctic—provide tremendous value to the United States. Without a significant Arctic Research Program, however, those things we value in and from the Arctic—energy, food, security, biodiversity, fresh water, carbon sinks, pristine wilderness, more direct transport routes, rich indigenous cultures—cannot contribute as well or be sustained. There is little human activity we know of in the Arctic that is not "knowledge based." The Arctic continues to be rich in mysteries that can only be solved with pioneering, exploration and research. With greater knowledge, the Arctic region can contribute more to both the global economy and the environment. Knowledge about Arctic processes can help protect the world from expensive, unnecessary, and destructive climate change.

The U.S. Arctic Research Program must strengthen its efforts on five central and crosscutting themes:

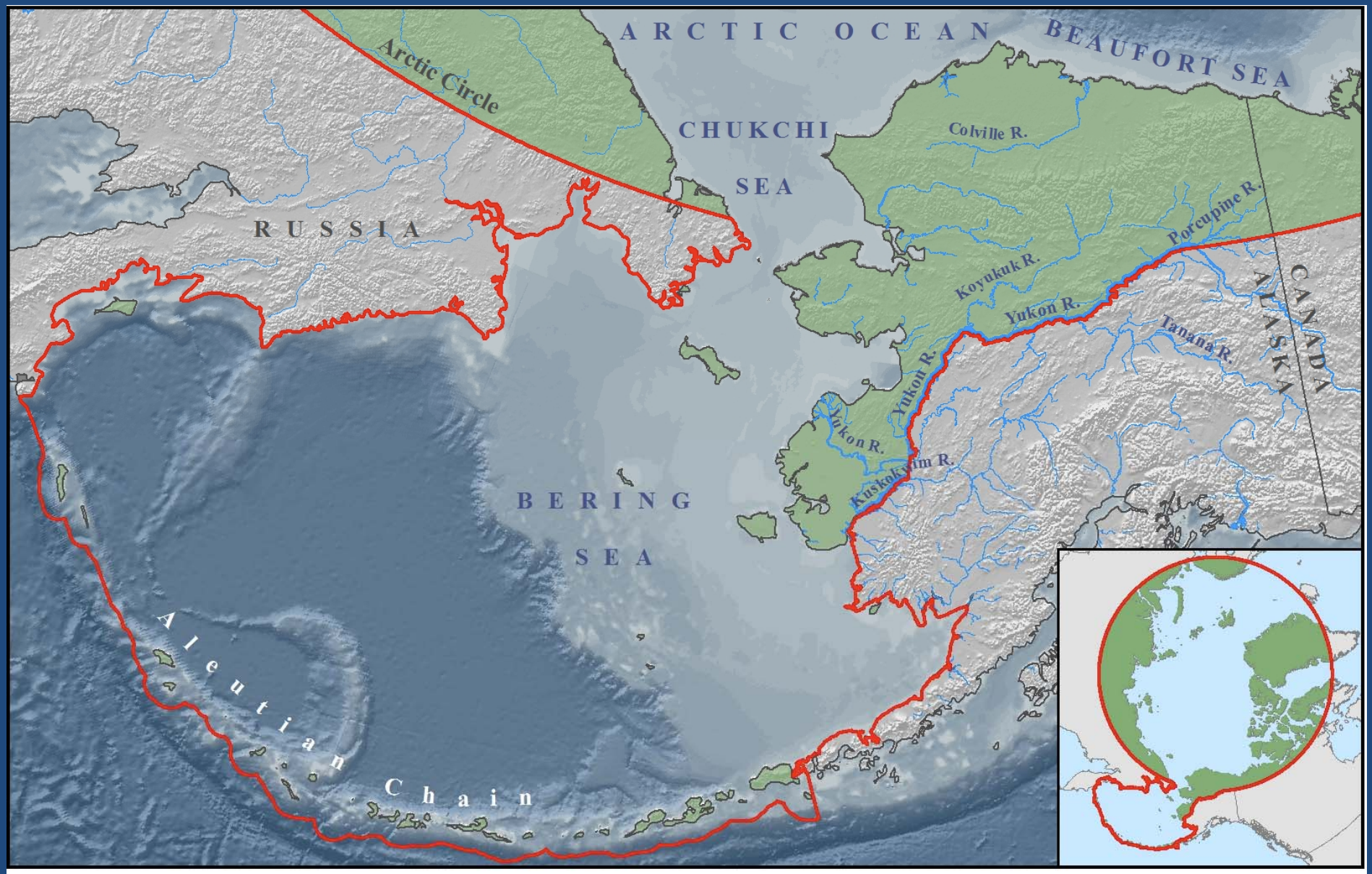
1. Environmental Change of the Arctic, Arctic Ocean, and Bering Sea
2. Arctic Human Health
3. Civil Infrastructure
4. Natural Resource Assessment and Earth Science
5. Indigenous Languages, Cultures, and Identities

"The opening of the 'fifth ocean," the Arctic, for longer periods of time, will provide new access to resources, migration of fishing stocks and eventually new trade routes, that can't be overstated."

-Chief of Naval Operations
Adm. Gary Roughead

Remarks at University of Chicago
Conf. on Terrorism & Strategy
October 12, 2010

Arctic region defined in US law




Seattle
Barrow
Minneapolis
Kotzebue
Boston
New York City
Nome
Fairbanks
Chicago
San Francisco
Denver
Washington DC
Anchorage
Juneau
Dillingham
Los Angeles
Sitka
Attu
Kodiak
Ketchikan
Unalaska/Dutch Harbor
Houston
Miami

U.S. Arctic Policy (NSPD-66/HSPD-25)

- National/Homeland Security Interests
- International Governance
- Extended Continental Shelf and Maritime Boundaries
- Promoting International Scientific Cooperation
- Maritime Transport
- Economic/Energy
- Environmental Protection

Seven policy areas – one overarching legal dynamic – relationship between international law, mainly the law of the sea and national sovereignty

What is the USARC?

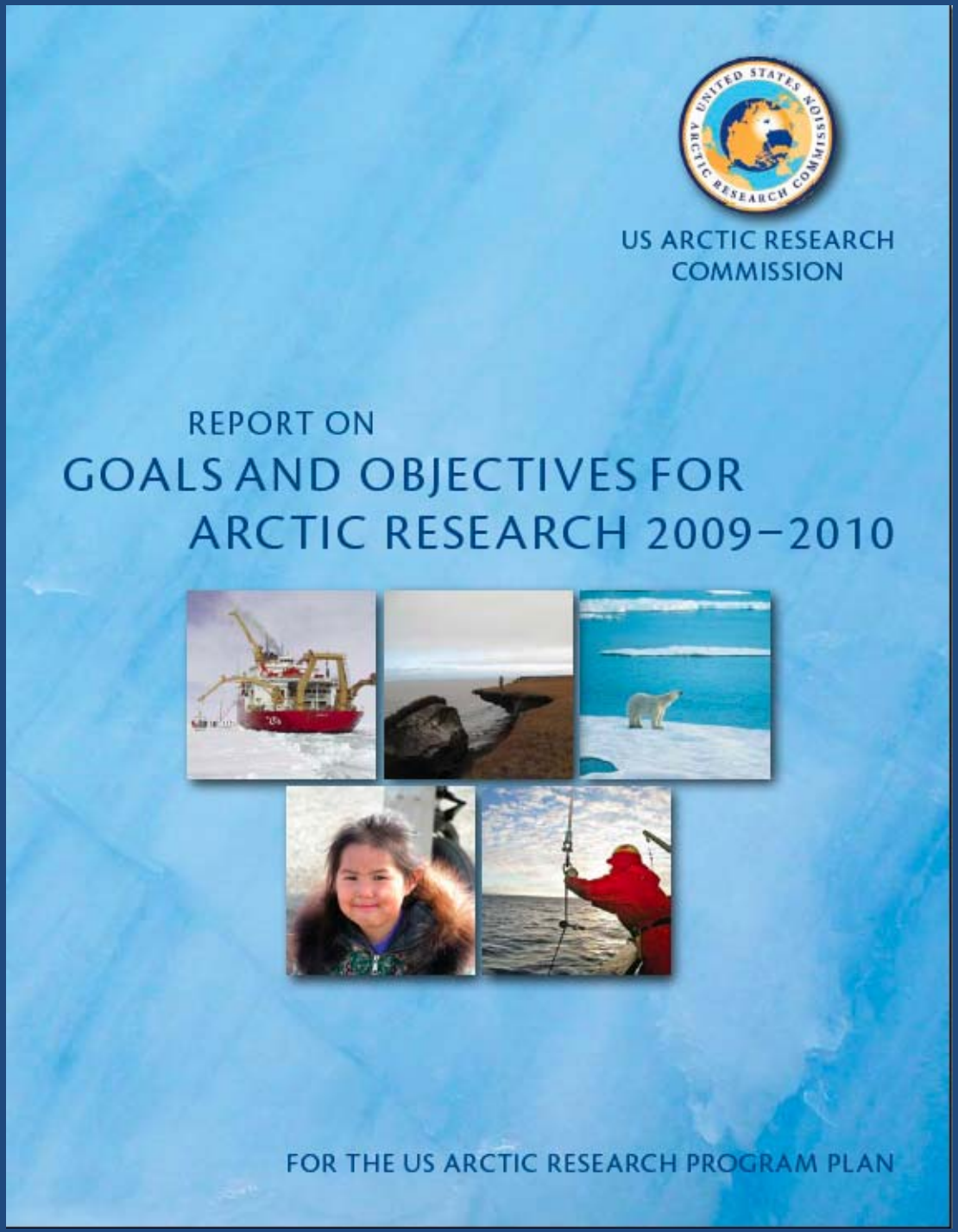
• Independent federal agency of presidential appointees that works with Congress and Executive branch

• Sets nation's Arctic research goals and objectives

• Develops an integrated national Arctic research policy

• Helps create a national Arctic research program plan

• Facilitates cooperation among federal, state and local governments, and other nations with respect to Arctic research, both basic and applied

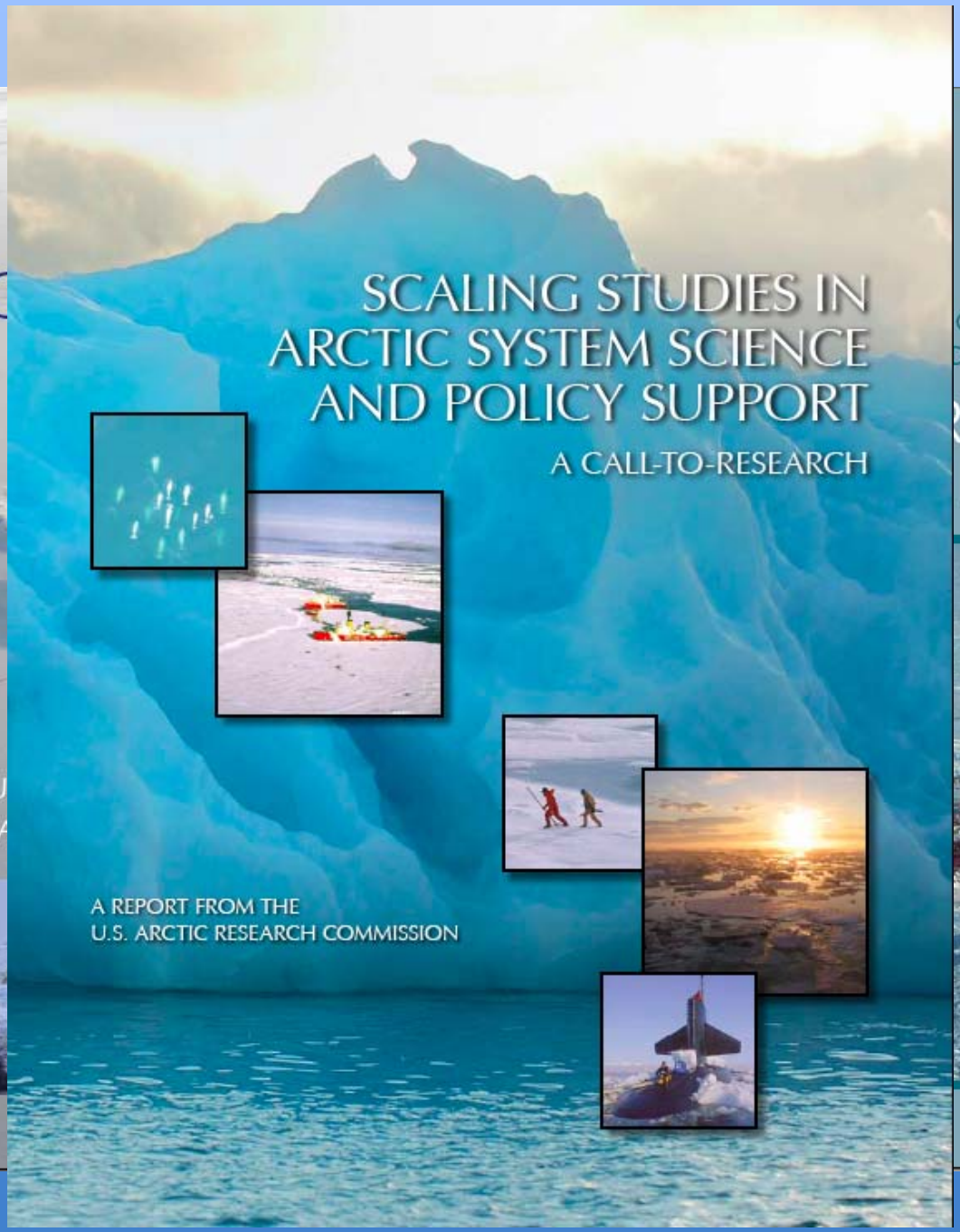


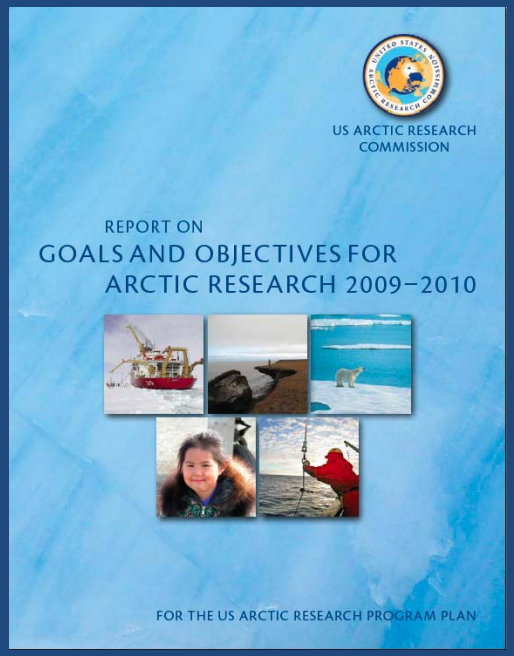
USARC sets nation's Arctic research goals

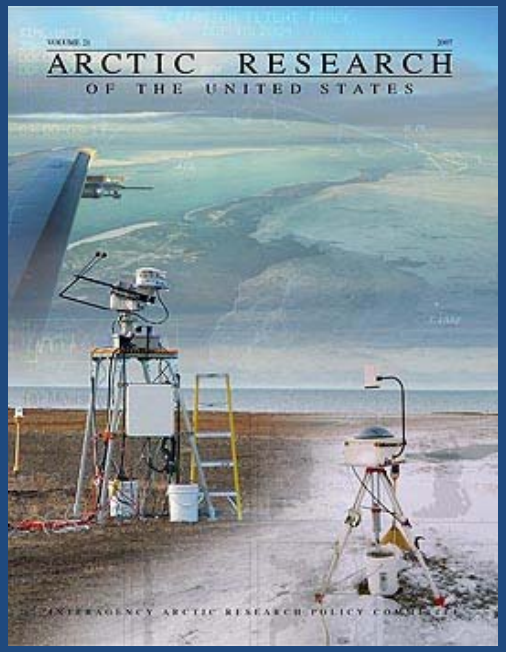
SCALING STUDIES IN ARCTIC SYSTEM SCIENCE AND POLICY SUPPORT

A CALL-TO-RESEARCH

A REPORT FROM THE
U.S. ARCTIC RESEARCH COMMISSION







USARC: establishes research goals & sets research policy

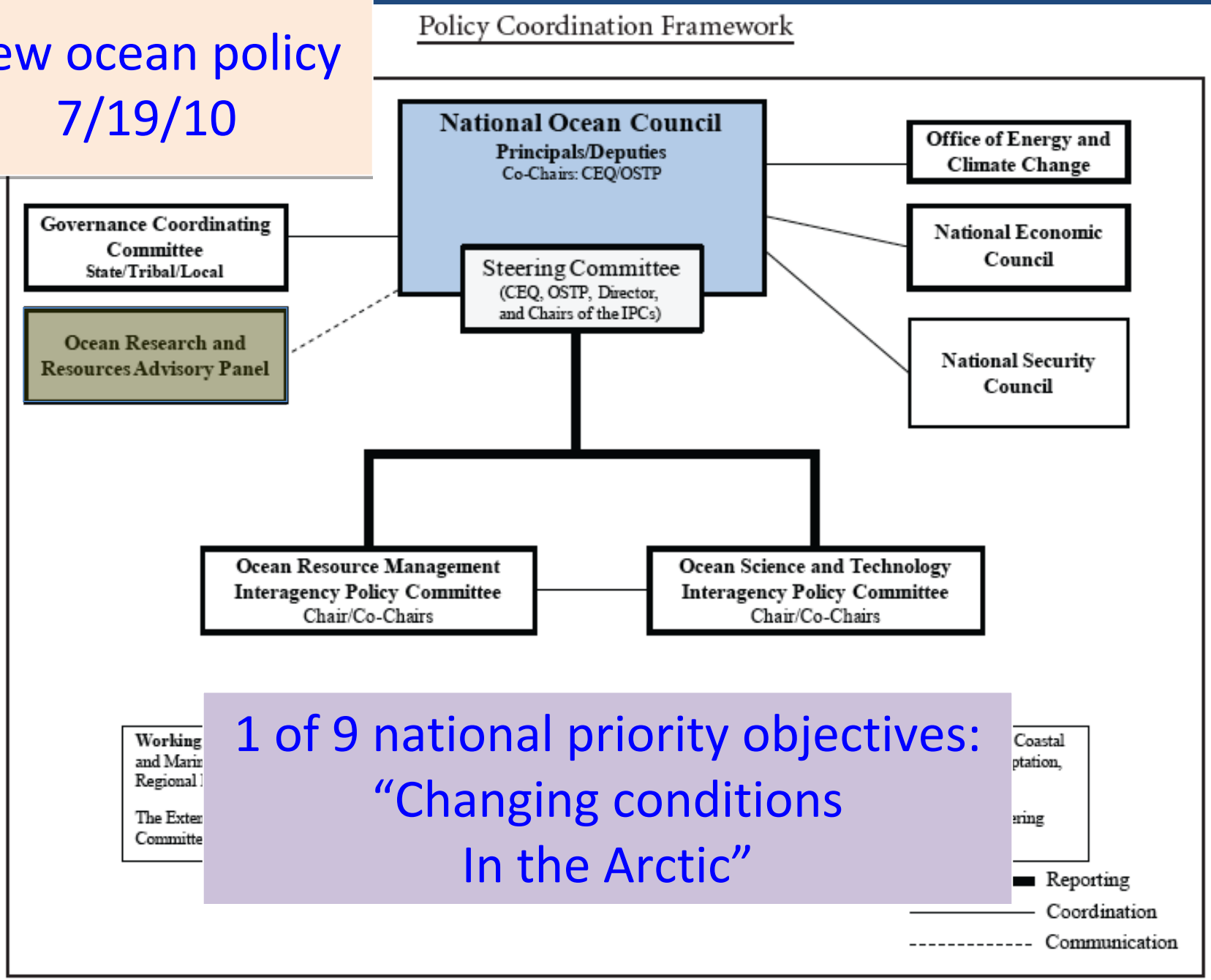
IARPC: adopts goals, creates research plan

White House: OMB/OSTP

Congress: authorizers & appropriators

USARC comments on budget to Congress

New ocean policy 7/19/10



1 of 9 national priority objectives:
"Changing conditions
In the Arctic"

President reassigns Arctic research coordination from NSF to NSTC

THE WHITE HOUSE

WASHINGTON

July 22, 2010

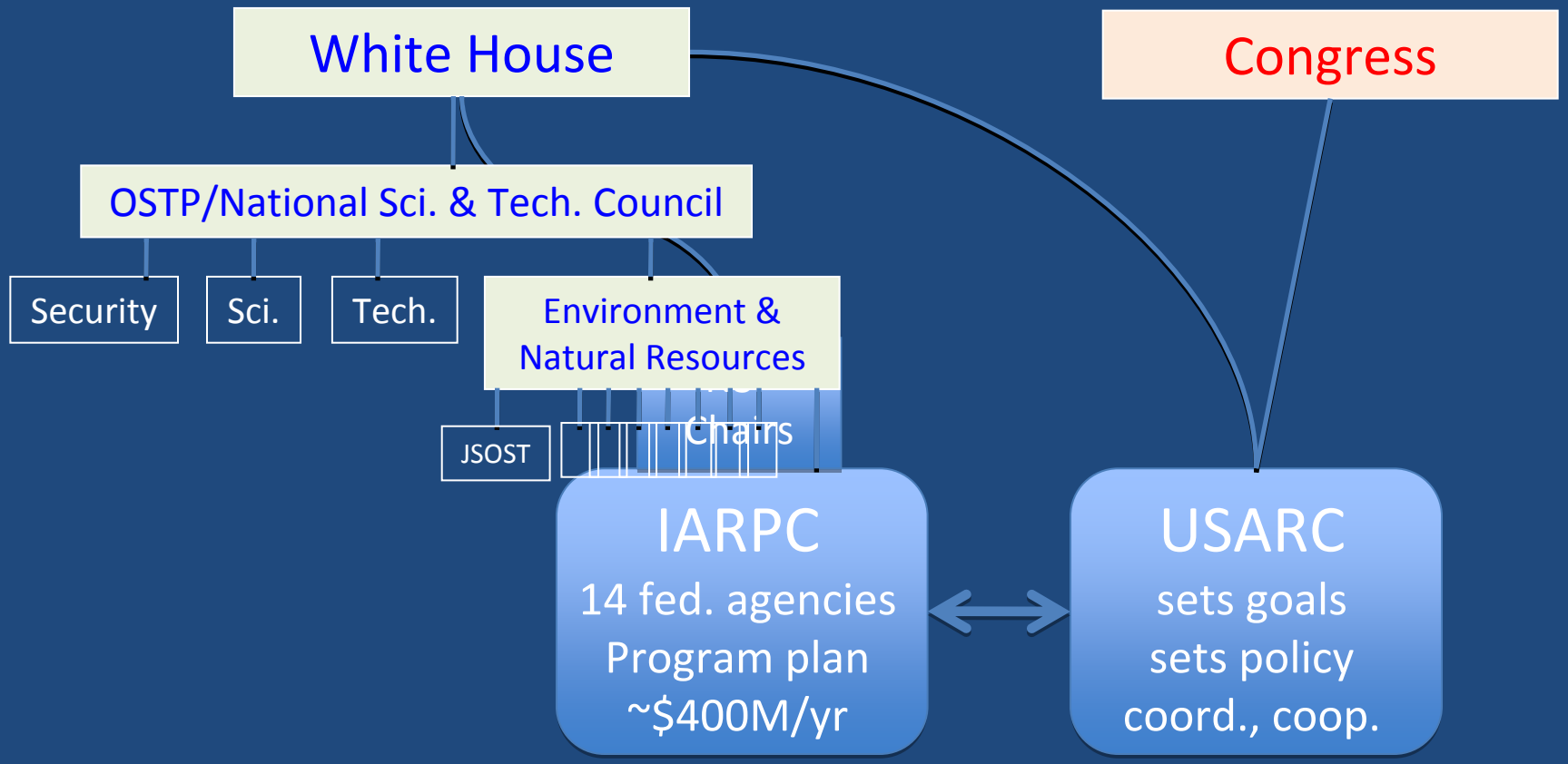
MEMORANDUM FOR THE DIRECTOR OF THE OFFICE OF SCI
AND TECHNOLOGY POLICY

SUBJECT: Designation of the National Science and Technology Council to Coordinate Certain Activities Under the Arctic Research and Policy Act of 1984

By the authority vested in me as President by the Constitution and the laws of the United States, including the Arctic Research and Policy Act of 1984 (Title I of Public Law 98-373) (the "Act"), I hereby assign to the National Science and Technology Council (NSTC) responsibility to coordinate activities assigned in sections 107 and 108 of the Act to the Interagency Arctic Research Policy Committee, including through committees of the NSTC.

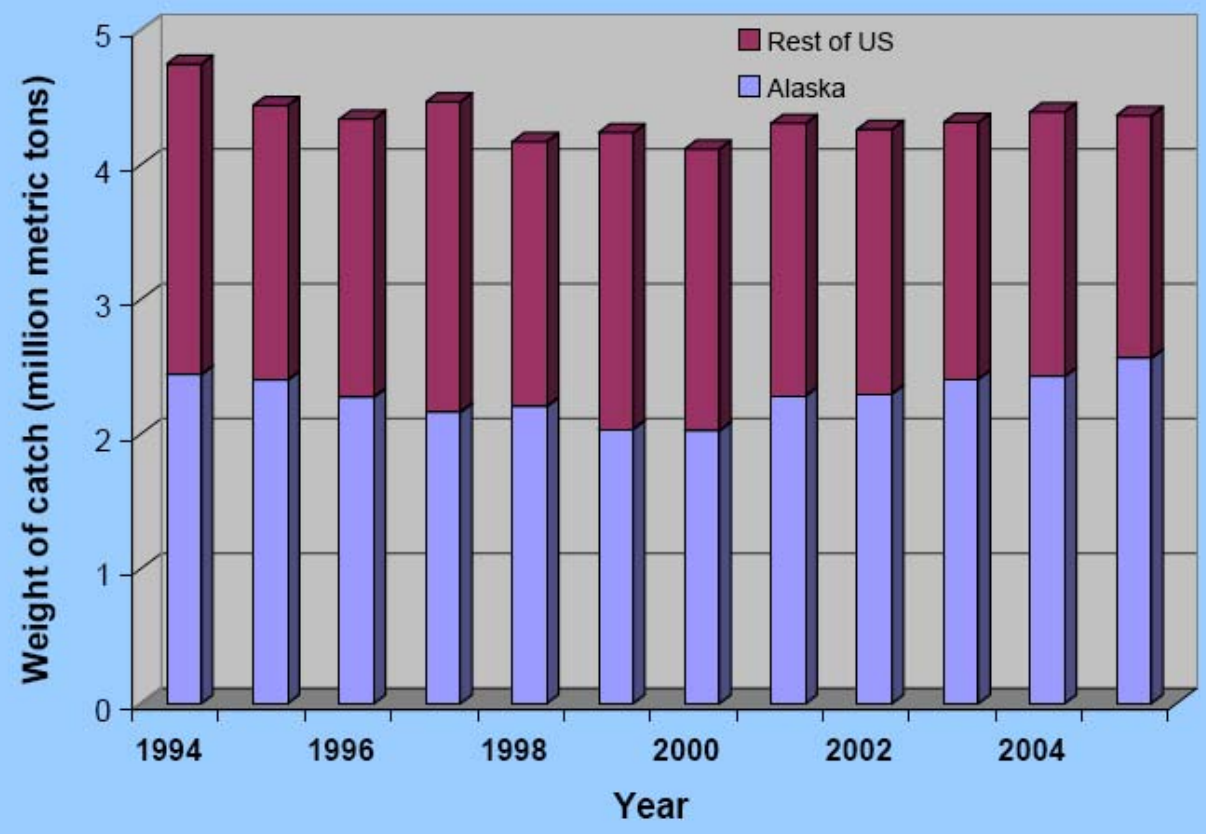
The Director of the Office of Science and Technology Policy is authorized and directed to publish this memorandum in the *Federal Register*.

Impact on Arctic Research Coordination From 7/22/10 Presidential Memo



Alaska Feeds the Nation

Largest private sector employer in Alaska



Dr. Mike F. Sigler, NMFS, 6/29/09 talk Ice-Diminished Arctic

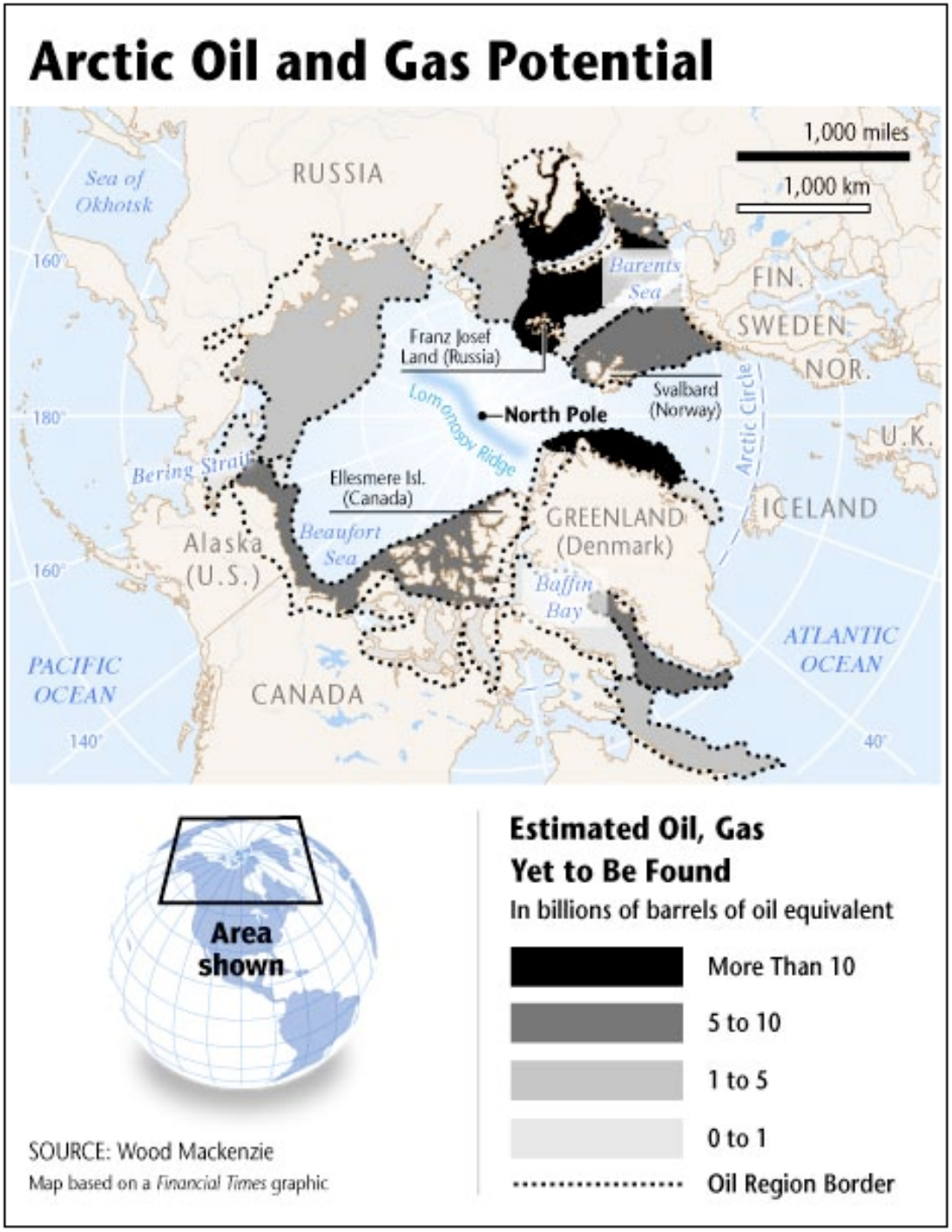
Arctic has much of world's remaining "undiscovered" fossil fuel

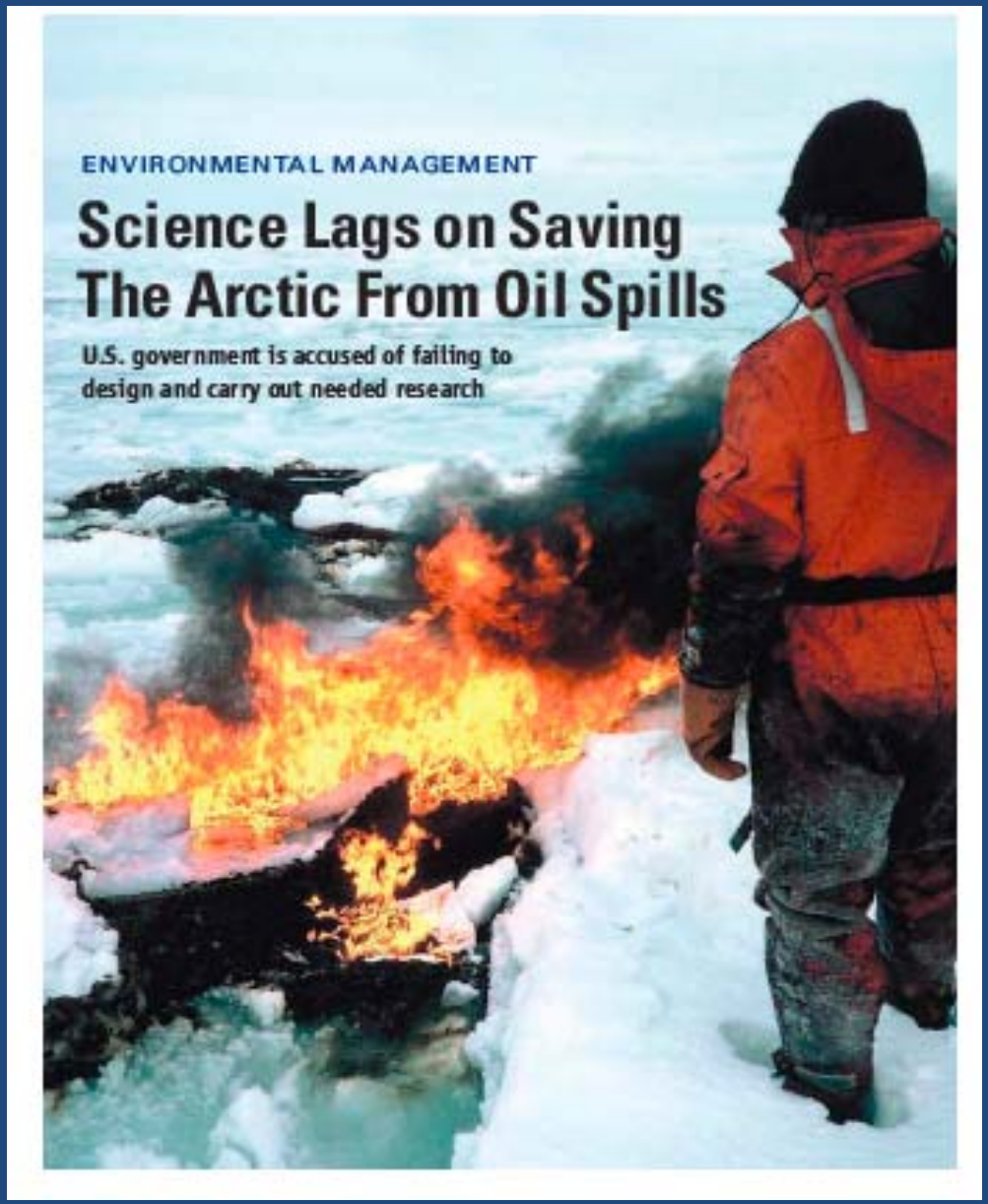
13% oil

30% natural gas

20% natural gas liquids

2009 USGS CARA report





Oil-spill-in-ice research

- Interagency Coordinating Committee on Oil Pollution Research (ICCOPR).

- National oil-spill research plan not updated since ’97


Arctic Council
Arctic Marine Shipping Assessment 2009 Report
ARCTIC MARINE SHIPPING ASSESSMENT

Select AMSA Findings

- UNCLOS and IMO ~ fundamental frameworks. Need to ratify.
- Winter sea ice remains but multi-year ice won't
- No specific, mandatory IMO enviro. standards for Arctic vessels
- Nearly all vessel traffic (thus far) is destinational
- Key drivers ~ natural resource development & regional trade
- Arctic residents ~ concerns & recognition of benefits
- Greatest threat ~ oil release through accidental or illegal discharge
- General lack of marine infrastructure

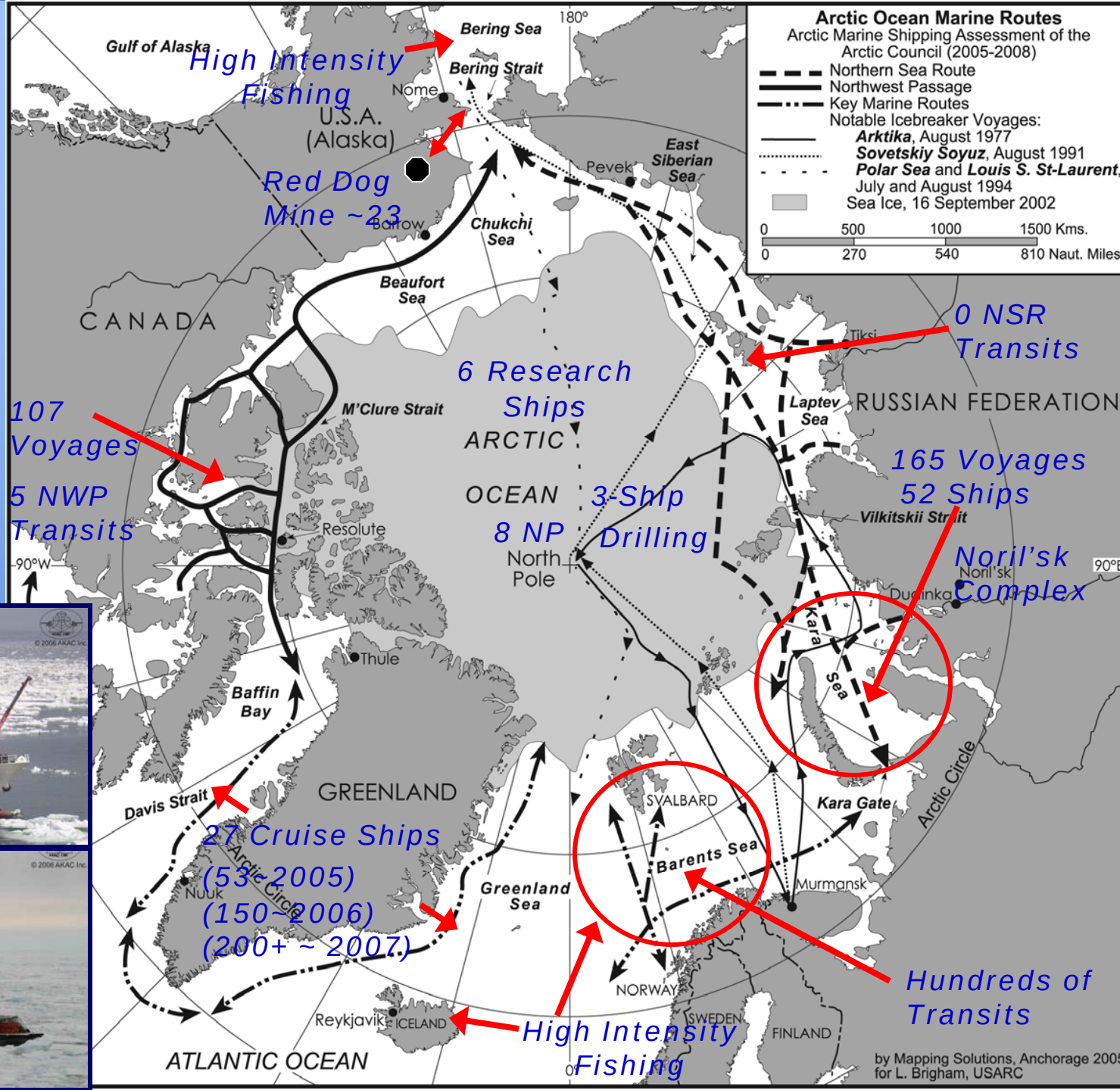
The Maritime Arctic of 2004

Snapshot of Summer

5475 Ships

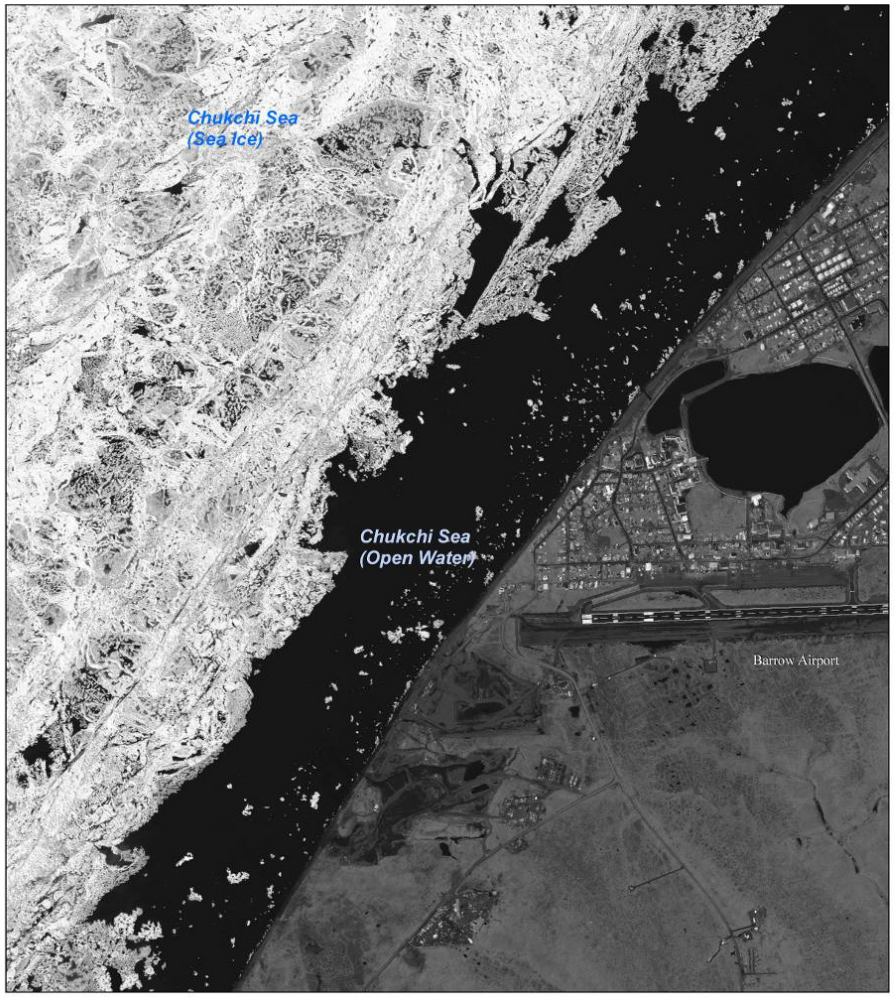
Modes of Arctic Marine Transport

- -Destinational & Regional
- -Trans-Arctic
- -Trans-Arctic with Transshipment
- -Intra-Arctic

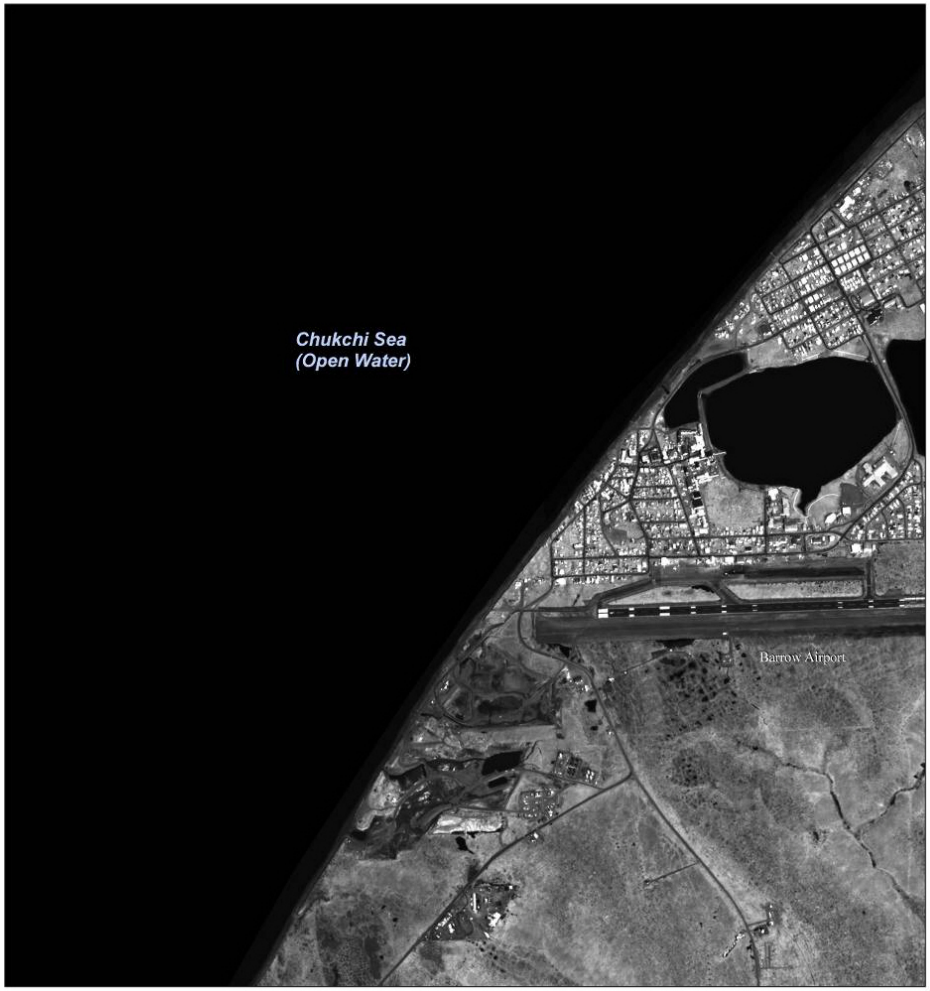


Barrow, Alaska

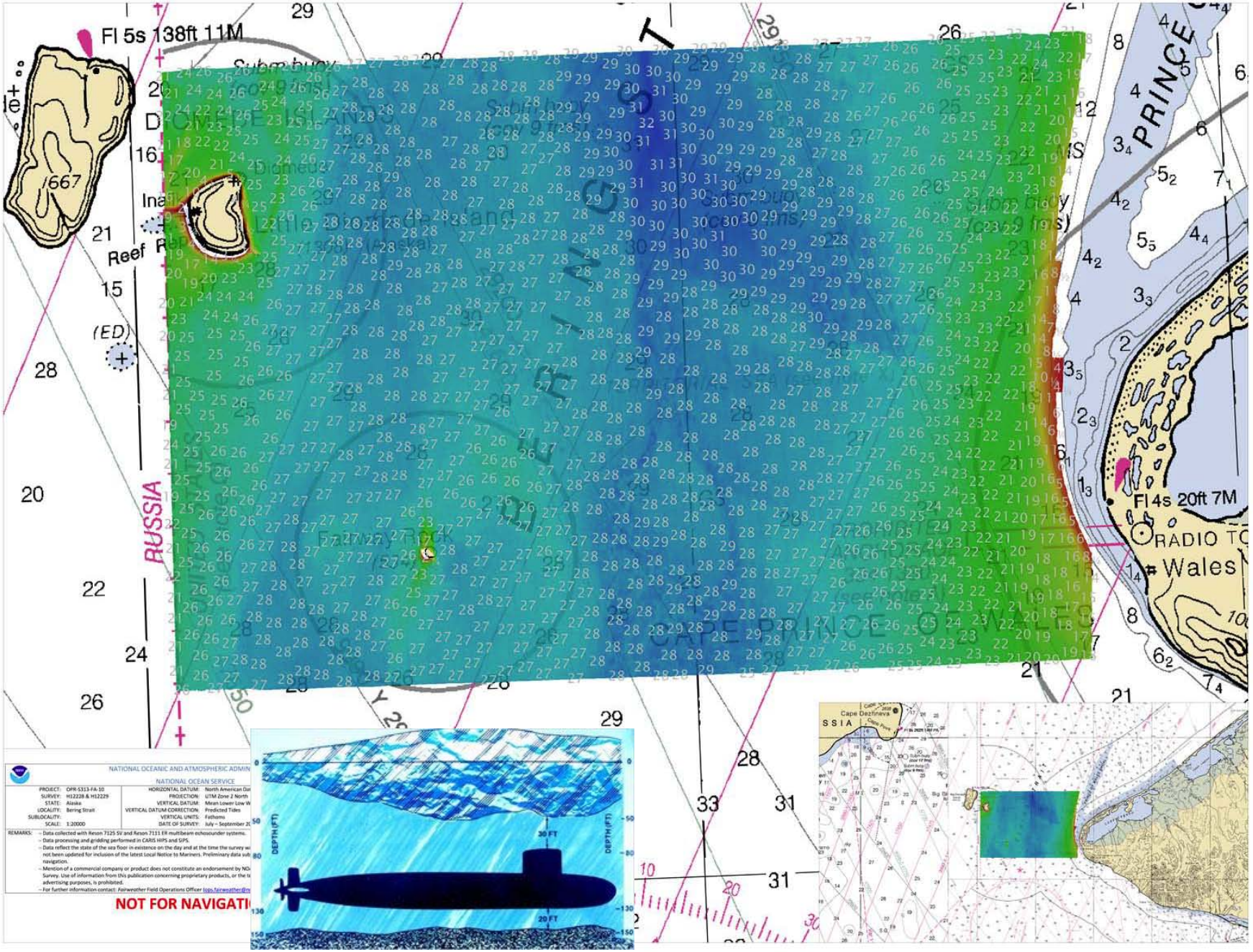
July 2006



July 2007




East Siberian
Sea
WRANGEL
ISLAND
Pevek
RUSSIA
NORTH
0
200
400
Kilometres


Fl 5s 138ft 11M
667
Reef
(ED)
RUSSIA
PRINCE
Fl 4s 20ft 7M
RADIO TO
Wales
Cape Dezhneva
SSIA
NATIONAL OCEANIC AND ATMOSPHERIC ADMIN
NATIONAL OCEAN SERVICE
PROJECT: OPR-S313-FA-10
SURVEY: H12228 & H12229
STATE: Alaska
LOCALITY: Bering Strait
SUBLOCALITY:
SCALE: 1:20000
HORIZONTAL DATUM: North American Dat
PROJECTION: UTM Zone 2 North
VERTICAL DATUM: Mean Lower Low W
VERTICAL DATUM CORRECTION: Predicted Tides
VERTICAL UNITS: Fathoms
DATE OF SURVEY: July – September 2
REMARKS:
– Data collected with Reson 7125 SV and Reson 7111 ER multibeam echosounder systems.
– Data processing and gridding performed in CARIS HIPS and SIPS.
– Data reflect the state of the sea floor in existence on the day and at the time the survey w
not been updated for inclusion of the latest Local Notice to Mariners. Preliminary data sub
navigation.
– Mention of a commercial company or product does not constitute an endorsement by NO
Survey. Use of information from this publication concerning proprietary products, or the t
advertising purposes, is prohibited.
– For further information contact: Fairweather Field Operations Officer
NOT FOR NAVIGATI
DEPTH (FT)
30 FT
20 FT

Greenland 2005 Melt Extent

Total Greenland ice sheet melt area increased on average by 20% from 1979 to 2006. On the western part of the ice sheet the melt area increased by 30%

2005 Melt Extent

Mean Melt Extent (1979 - 2005)

The increasing trend in the total area of melting bare ice is unmistakable at 13% per year

Swiss Camp

Aasiaat

Kangerlussuaq

Sisimiut

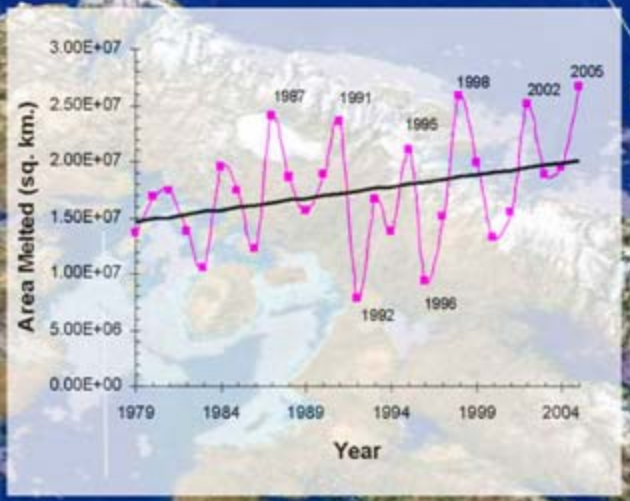
Nuuk

Paamiut

Qaqortoq

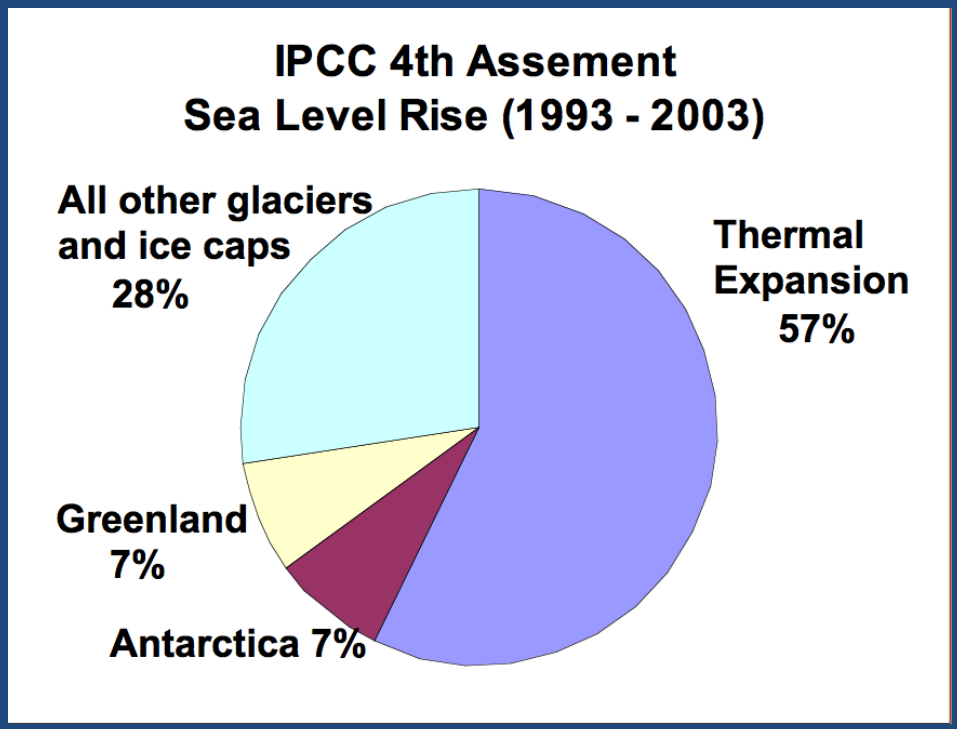
Narsarsuaq

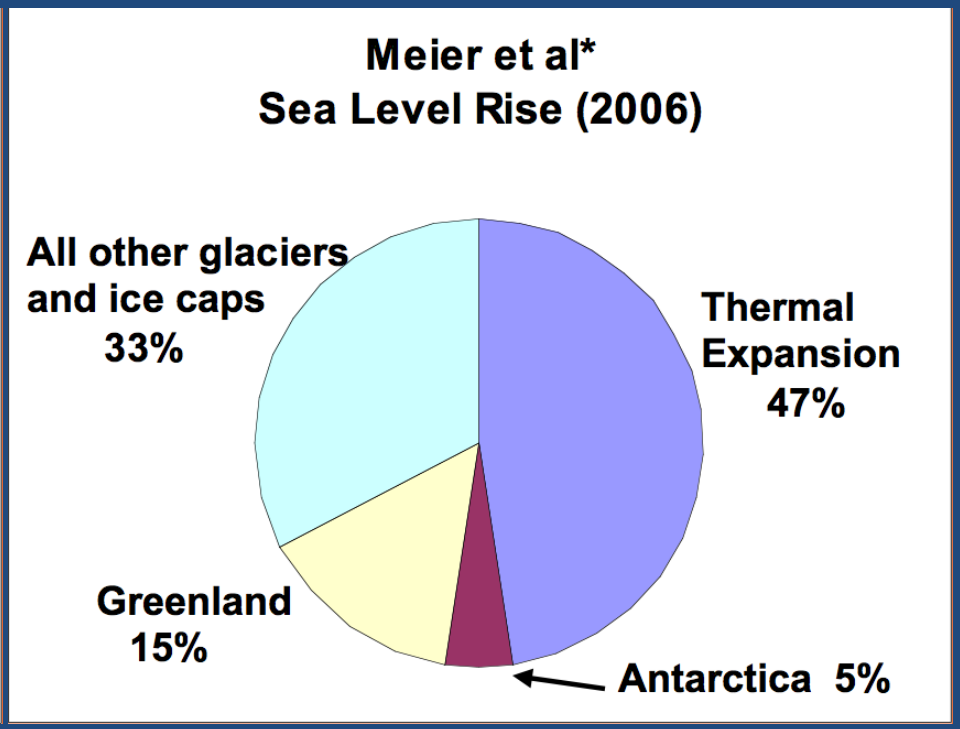
Tasiilaq



Russell Huff and Konrad Steffen, University of Colorado/CIRES

Sea Level Rise – Present day contributions

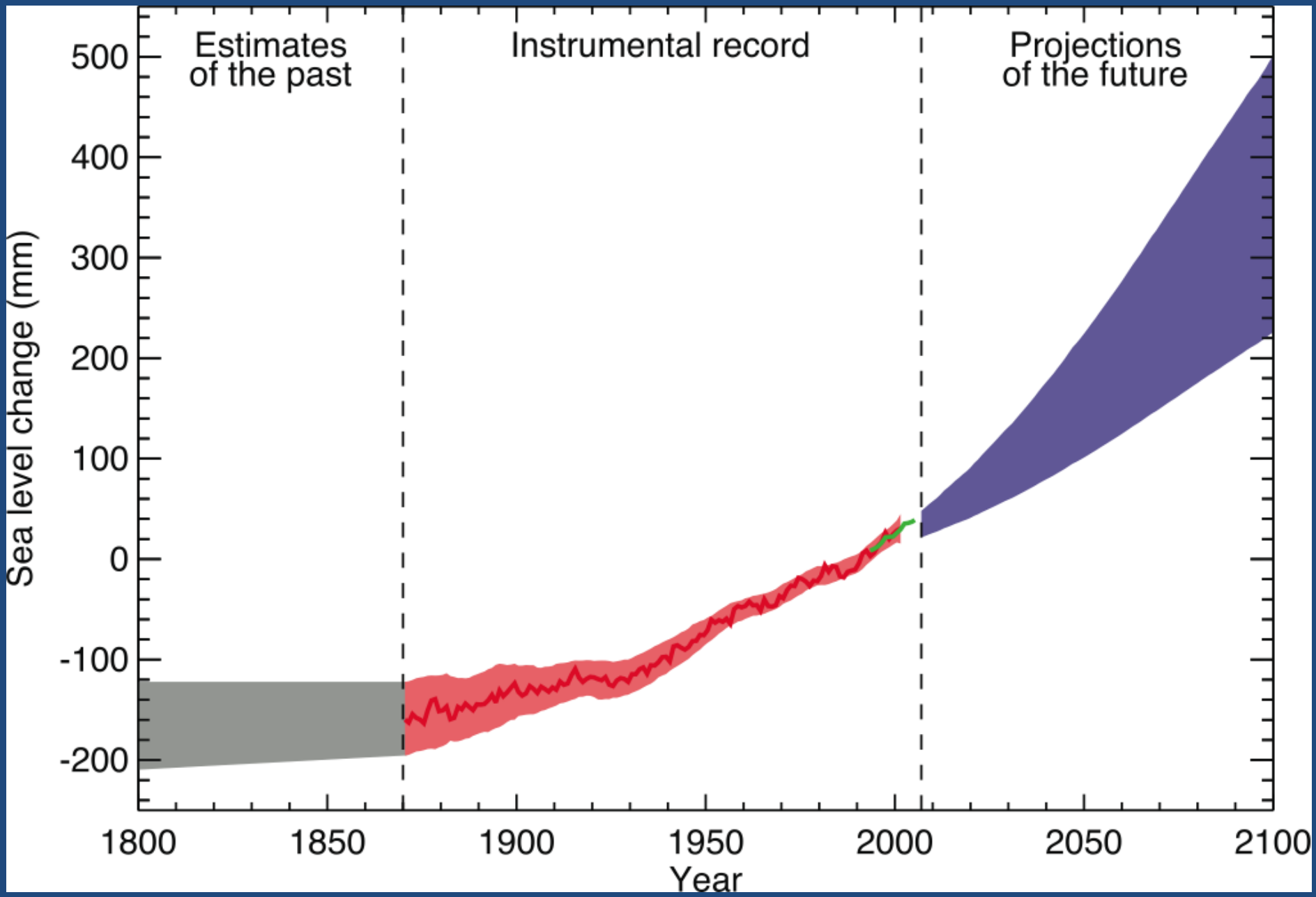




Let's get the physics right, and evaluate the dynamic discharge from ALL sources

*Meier et al, *Science*, 21 July, 2007 Small Glaciers Dominate Sea Level Rise in the 21st Century

From Bob Anderson, INSTAAR


Estimates
of the past
Instrumental record
Projections
of the future
Sea level change (mm)
500
400
300
200
100
0
-100
-200
1800
1850
1900
1950
2000
2050
2100
Year

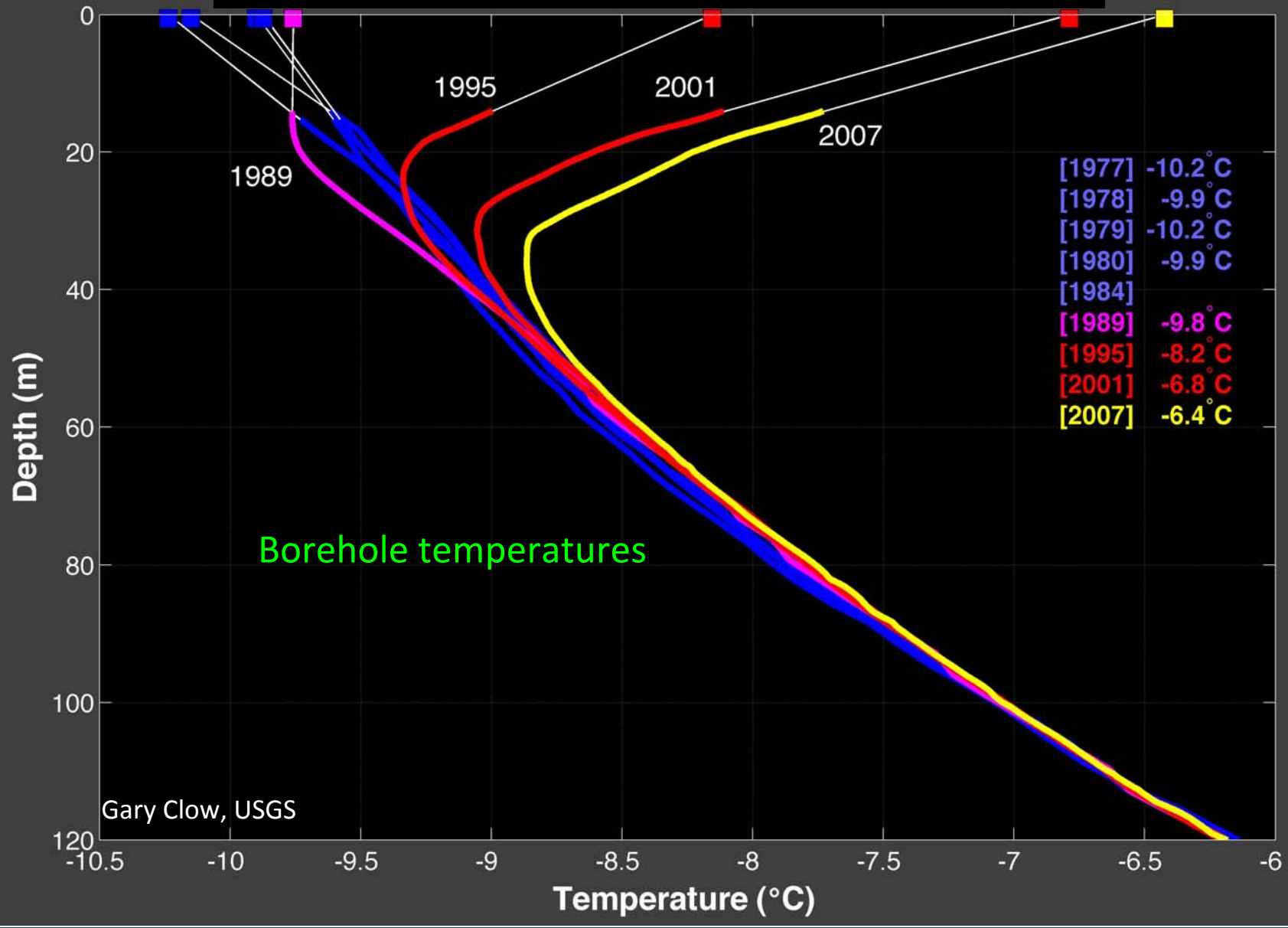
Florida inundation
1 meter (3.3 ft) sea level rise

Miami Beach

1-m sea level rise

Population:
87,933

Permafrost warming: Arctic Coastal Plain



Measured temperature profiles with extrapolated surface temperatures.
Surface temps were ~ **3.6°C warmer** during 2007 than during the late-70's, early-80's.

Permafrost Degradation – North Slope, AK

Gary Clow, USGS

July 2003

J.W. Dalton Wellsite

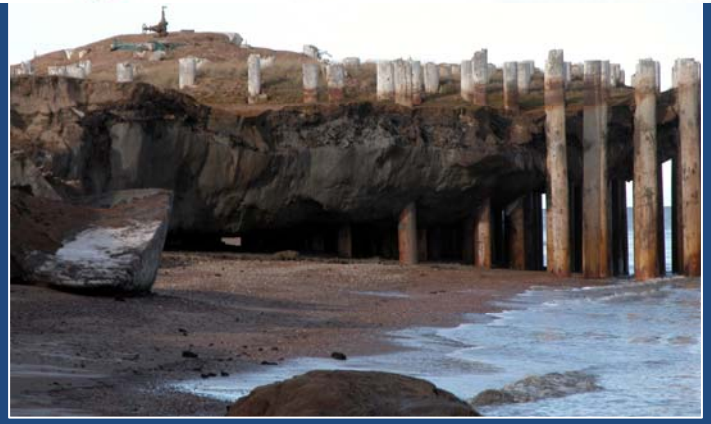
1998 Shoreline

September 2004 =324' Erosion

July 2001 Shoreline

July 2003=115' Erosion

100 m of Arctic coastal erosion summer 2004



Sept 2004

S. Flora, BLM

Alaskan Arctic coastal villages

Two-hour time lapse showing storm damage in Shismaref, Alaska

Qanuqtuurungnarniq

…the concept of being resourceful, demonstrating adaptability and flexibility in response to a rapidly changing world.

Nettie Foxglove
Selawik, AK
Nikki Kahn/TWP photo

Boost infrastructure for Arctic Research

- Sustainable Arctic Observing Network (intl' coop.)
- Cabled (fiber optic) observatories
- Icebreakers
- Alaska Region Research Vessel (Yes)
- Barrow & Intl' Arctic Research Centers
- Advance use of robotic remote sensing (sea, air, space)
- Satellites (NASA's ICESat-II, GRACE-II, others)
- Declassify US intelligence data, mapping, imagery
- Nuclear submarines (SCICEX), ice camps

Recommendations today

- Improve interagency Arctic research efforts & dovetail with new ocean policy efforts
- Get serious on Arctic Observing Network
  - Environmental research (wx, climate, sea ice, perma.)
  - Ice sheet and glacier dynamics
- Oil-spill-in ice research
- Ocean research infrastructure
  - US icebreakers (psst… we're down to one)

If implemented, the results will help Navy achieve Arctic missions in:

- Strategic deterrence
- Force Projection
- Maritime Security
- Maritime Domain Awareness
- Search and Rescue
- Regional Security Cooperation
- Humanitarian Assistance/Disaster Relief


9/23/10
Blake McBride, USN
USCG C-130
ADA flight
Thank you